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EXDIS, OECD FOR IEA SECRETARIAT

E.O. 11652: GDS

TAGS: PARM, TECH, MNUC

SUBJECT: INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION

REF: (A) STATE 091828 (B) STATE 112196

1. FOLLOWING IS PAPER OUTLINING A REVISED POSSIBLE APPROACH TO THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION. ORIGINAL APPROACH PAPER WAS TRANSMITTED BY REF A.

2. BEGIN TEXT. THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION (A POSSIBLE APPROACH: REVISED).

A. THE OBJECTIVES OF THE INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION ARE TO:

-- ENHANCE INTERNATIONAL COOPERATION IN DEALING WITH COMMON CONCERNS RELATED TO THE USE OF NUCLEAR POWER FOR CIVIL PURPOSES, AND PROVIDE A FORUM FOR EXCHANGE OF
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VIEWS AND VOLUNTARY HARMONIZATION OF POLICY, AND

-- PROVIDE INFORMATION TO GUIDE THE DEVELOPMENT OF ALTERNATIVE NUCLEAR POWER SYSTEMS THAT MINIMIZE POTENTIAL PROLIFERATION WHILE ASSURING RELIABLE ECONOMIC AND ENVIRONMENTALLY ACCEPTABLE ENERGY SUPPLIES FOR EACH

NATION. THE PROGRAM WILL IDENTIFY AND ASSESS THE FEASIBILITY OF ALTERNATE SYSTEMS TO MEET ENERGY NEEDS ON A TIMELY BASIS.

B. EACH PARTICIPATING COUNTRY AND INTERNATIONAL ORGANIZATION WOULD CONTRIBUTE TO THE OBJECTIVES SET FORTH IN PARAGRAPH L ABOVE BY APPLYING SCIENTIFIC, TECHNICAL AND FINANCIAL RESOURCES, ALONE OR IN COOPERATION WITH OTHERS AS IT DEEMS APPROPRIATE, TO PROGRAMS AND PROJECTS COMMONLY IDENTIFIED AS USEFUL IN THE EVALUATION.

C. THE PARTICIPANTS COULD DESIGNATE NATIONAL AGENCIES OR OTHER PUBLIC OR PRIVATE ORGANIZATIONS AS THE VEHICLE FOR THEIR CONTRIBUTION TO THE EVALUATION.

D. THE EVALUATION PROGRAM WILL CONSIST OF A NUMBER

OF COORDINATED RESEARCH AND STUDY PROGRAMS RELATED TO EXISTING FUEL CYCLES AND FUTURE CYCLE ALTERNATIVES. COUNTRIES AND INTERNATIONAL ORGANIZATIONS INTERESTED IN PARTICIPATING IN RESEARCH AND EVALUATION IN A PARTICULAR AREA WILL WORK TOGETHER. ONE OR MORE OF THE PARTICIPANTS, AS AGREED AMONG THEMSELVES, WOULD BE DESIGNATED AS THE LEAD PARTICIPANTS, I.E., RESPONSIBLE FOR ARRANGING MEETINGS AND COORDINATING WORK IN THE PARTICULAR AREA. THE OVERALL EVALUATION WILL BE COORDINATED THROUGH PARTICIPATION IN A STEERING COMMITTEE WHICH WOULD MEET TO LAUNCH THE PROGRAM AND PERIODICALLY TO ASSESS PROGRESS. THE STEERING COMMITTEE CAN CONSIST
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OF REPRESENTATIVES OF LEAD PARTICIPANTS AND OTHER PARTICIPATING COUNTRIES AS WELL AS REPRESENTATIVES OF INTERNATIONAL ORGANIZATIONS WITH A MAJOR INTEREST IN THE EVALUATION.

E. DISCUSSION OF AN OVERALL INFCE PLAN AND SCHEDULE SHOULD TAKE PLACE IN THE NEXT FEW MONTHS. WE WOULD HOPE THAT IDENTIFICATION OF LEAD PARTICIPANTS AND JOINT EXAMINATION OF A WORK PLAN FOR EACH MAJOR AREA COULD PROCEED IN PARALLEL, WITH WORK IMPLEMENTATION IN SOME AREAS BEGINNING IN EARLY FALL. AT THIS JUNCTURE, THE U.S. BELIEVES THERE WOULD BE MERIT IN LAUNCHING THE PROGRAM THROUGH A STEERING COMMITTEE MEETING THAT WOULD DIRECT VARIOUS TECHNICAL WORKING GROUPS TO DEFINE AND DEVELOP AREAS OF MUTUAL INTEREST. THESE GROUPS WOULD REPORT BACK TO THE STEERING COMMITTEE. WE WOULD EXPECT THE GENERAL REVIEW OF RESULTS AND DISCUSSION OF FURTHER WORK IN ABOUT TWO YEARS, INCLUDING A POSSIBLE PRIORITIZING OF ITEMS FOR FURTHER DEVELOPMENT.

F. THE WORK OF THE EVALUATION WOULD BE COORDINATED WITH AND MAKE USE OF THE CAPABILITIES OF THE IAEA. THE IAEA COULD BE REPRESENTED ON THE STEERING COMMITTEE. THE RESULTS OF WORKING GROUPS WOULD BE FED INTO THE IAEA PROGRAM THROUGH SYMPOSIA AND PUBLICATIONS. IAEA EXPERTS COULD PARTICIPATE IN WORKING GROUPS AND MIGHT FUNCTION AS LEAD PARTICIPANTS IN SOME AREAS. PERIODIC OVERALL REVIEWS COULD TAKE PLACE UNDER IAEA AUSPICES. THE CAPABILITIES OF OTHER ORGANIZATIONS COULD BE APPLIED AS APPROPRIATE.

G. PARTICIPATING NATIONS WOULD, IN ACCORDANCE WITH THEIR OWN INTERESTS AND PROGRAMS, UNDERTAKE AND CO-ORDINATE RESEARCH AND EVALUATION IN THE FOLLOWING SPECIFIC AREAS, AND OTHERS AS IDENTIFIED BY THE PARTICIPANTS:
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(1) AN INTERNATIONAL ASSESSMENT OF URANIUM AVAILABILITY AND DEMAND TAKING INTO ACCOUNT THE WORK ALREADY BEING PERFORMED BY THE IEA AND NEA. THIS WOULD INCLUDE CONSIDERATION OF COORDINATED EXPLORATION, JOINT RESOURCE DEVELOPMENT, AND MEASURES TO FACILITATE EXPORT/IMPORT ARRANGEMENTS CONSISTENT WITH PRUDENT NON-PROLIFERATION CONDITIONS. DIFFERING MARKET REGIMES AND INTERACTION WITH COMMERCIAL ISSUES WOULD BE TAKEN INTO ACCOUNT. A PARALLEL STUDY ON THORIUM COULD ALSO BE UNDERTAKEN.

(2) INVESTIGATION OF SOUND MINING TECHNIQUES FOR RECOVERY OF LOWER GRADE ORES.

(3) AN EVALUATION AMONG INTERESTED STATES OF URANIUM ENRICHMENT REQUIREMENTS AND PROJECTED CAPACITY. THIS WOULD INCLUDE CONSIDERATION OF JOINT PLANNING TO ENSURE ADEQUATE CAPACITY AND OF COLLABORATIVE INVESTMENT OPPORTUNITIES.

(4) AN EXAMINATION OF POSSIBLE INSTITUTIONAL ARRANGEMENTS DESIGNED TO ASSURE LONG-TERM FUEL SUPPLY. THIS WILL INCLUDE ANALYSES OF SUCH ARRANGEMENTS AS BILATERAL SUPPLIER-CONSUMER GUARANTEES, MULTINATIONAL ARRANGEMENTS THAT WOULD PERMIT CONSUMER INVESTMENT IN ENRICHMENT SERVICES, AND FUEL POOLING, ALL AIMED AT INSURING ACCESS ON A NON-DISCRIMINATORY BASIS TO REACTOR FUEL TO COUNTRIES MEETING MUTUALLY AGREED NON-PROLIFERATION CONSTRAINTS.

(5) AN EXAMINATION OF DEMAND AND ASSURED SUPPLY ARRANGEMENTS FOR HEAVY WATER.

(6) COORDINATED RESEARCH, INFORMATION EXCHANGE AND TECHNICAL AID IN FOSTERING NEAR-TERM OPTIONS FOR INCREASING SPENT FUEL STORAGE INCLUDING TECHNOLOGIES FOR CONFIDENTIAL

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MORE EFFICIENT UTILIZATION OF EXISTING SPENT FUEL CAPACITY (E.G., NEUTRON ABSORBING RACKS) AND TECHNOLOGIES FOR RAPIDLY INSTALLING ADDITIONAL CAPACITY. STUDIES DESIGNED TO FACILITATE THE SAFE AND ECONOMICAL TRANSPORTATION OF SPENT FUEL AND RADIOACTIVE WASTES.

(7) POSSIBLE ESTABLISHMENT OF INTERNATIONAL SPENT FUEL REPOSITORIES, INCLUDING STUDIES ON A REGIONAL BASIS TO ASSESS SITES FOR SUCH REPOSITORIES AND DEVELOP LEGAL, FINANCIAL AND INSTITUTIONAL FRAMEWORKS FOR BRINGING SUCH REPOSITORIES INTO EXISTENCE.

(8) STUDIES ON LONG-TERM RETRIEVEABLE STORAGE.

THIS WOULD INCLUDE CONSIDERATION OF VARIOUS RESEARCH CONCEPTS AND COMPARISON OF EXPERIMENTAL RESULTS ON ON-GOING RESEARCH ON RETRIEVALABLE STORAGE TECHNOLOGIES.

(9) WORK ON THE TECHNOLOGY FOR PERMANENT STORAGE OF SPENT FUEL OR HIGH LEVEL WASTE, INCLUDING DISPOSAL CANISTER DESIGN AND TESTING. JOINT CONSIDERATION OF INTERNATIONAL REPOSITORIES WOULD ALSO BE UNDERTAKEN.

(10) A SYSTEMATIC ASSESSMENT OF THE COMPARATIVE ADVANTAGES OF VARIOUS REACTOR AND FUEL CYCLE CONCEPTS, TAKING INTO ACCOUNT RELEVANT CRITERIA PERTAINING TO NON-PROLIFERATION BENEFITS, TECHNICAL FEASIBILITY, ECONOMIC IMPLICATIONS, AND PROSPECTIVE USEFULNESS IN MEETING ENERGY NEEDS.

(11) RESEARCH ON VARIOUS TECHNICAL METHODS TO INCREASE ONCE-THROUGH URANIUM UTILIZATION IN LWRS AND HWRS, SUCH AS OPTIMIZED FUEL AND LOADING DESIGNS AND SPECTRAL SHIFT MODIFICATIONS THAT WOULD SIGNIFICANTLY INCREASE FUEL UTILIZATION AND REACTOR EFFICIENCY.

(12) RESEARCH PROGRAMS ON ADVANCED REACTORS,
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BREEDER ALTERNATIVES AND THORIUM USE, INCLUDING:

-- HTR ONCE-THROUGH APPLICATIONS USING LOW-ENRICHED URANIUM;

-- HTR THORIUM/URANIUM DENATURED FUEL CYCLE APPLICATIONS;

- VARIOUS BREEDER CONCEPTS, INCLUDING LIGHT WATER, THORIUM, SODIUM, AND GAS-COOLED BREEDERS, PARTICULARLY THOSE CONCEPTS WHICH, WHILE REQUIRING SENSITIVE FUELS AND FUEL CYCLE ELEMENTS, WOULD ALSO SUPPORT EXISTING OR FUTURE NON-SENSITIVE REACTOR CYCLES;

-- OTHER ADVANCED REACTOR CONCEPTS, INCLUDING RESEARCH ON REACTOR POSSIBILITIES THAT ARE IN THE CONCEPTUAL RATHER THAN EXPERIMENTAL STAGE, SUCH AS PARTICLE ACCELERATOR/REACTOR CONCEPTS, HOMOGENEOUS REACTORS, PLASMA REACTORS AND HYBRID FISSION/FUSION REACTOR CONCEPTS.

(13) EFFORTS IN THE AREA OF REPROCESSING AND RELATED TECHNICAL ALTERNATIVES INCLUDING:

-- ANALYTICAL STUDIES OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF REPROCESSING AND RECYCLE, INCLUDING THE RESULTS OF EXTENSIVE RECENT U.S. WORK ON THE ECO-

NOMIC AND ENVIRONMENTAL AFFECTS OF REPROCESSING AND
RECYCLE.

-- TECHNICAL ALTERNATIVES TO REPROCESSING TECHNIQUES WHICH PRODUCE PLUTONIUM IN A PURE FORM, TO INCLUDE INTERNATIONAL EVALUATION OF THE NON-PROLIFERATION, SAFEGUARDS, PHYSICAL PROTECTION AND ECONOMIC IMPLICATIONS OF TECHNIQUES SUCH AS URANIUM SEPARATION ONLY, VARIOUS COPROCESSING MODES, PYRO-CHEMICAL PROCESSING,
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AND THOREX REPROCESSING EVALUATION. (THE NON-PROLIFERATION AND OTHER IMPLICATIONS OF THE USE OF CONVENTIONAL REPROCESSING AND PLUTONIUM-HANDLING TECHNIQUES WOULD BE EMPLOYED AS A FRAME OF REFERENCE IN ASSESSING THE VALUE OF ALTERNATIVES.)

-- WITH REGARD TO REPROCESSING OR OTHER PROCESSES INVOLVING PRODUCTION AND USE OF WEAPONS-USABLE MATERIAL, AN EXAMINATION OF THE PROBLEMS ASSOCIATED WITH ATTEMPTING TO SAFEGUARD OR BETTER PROTECT THEM AND EVALUATION OF POSSIBLE FUTURE INTERNATIONAL ARRANGEMENTS TO REDUCE PROLIFERATION RISKS ASSOCIATED WITH ABROGATION OR TERMINATION OF SAFEGUARDS.

3. FOR PARIS, LONDON, BONN, OTTAWA, TOKYO, AND ROME: PURSUANT TO PARA 4, REF. B, EMBASSIES SHOULD PROVIDE COPIES TO APPROPRIATE HOST GOVERNMENT OFFICIALS EXPRESSING OUR BELIEF THAT IT WOULD SERVE AS A USEFUL FOCUS FOR DISCUSSIONS AT THE JUNE 8-9 SUMMIT EXPERTS MEETING IN PARIS.

4. FOR OTHER ADDRESSEES: PLEASE PROVIDE COPIES TO APPROPRIATE HOST GOVERNMENT OFFICIALS, EXPLAINING THAT THIS REVISED APPROACH PAPER REFLECTS COMMENTS WE HAVE RECEIVED ON THE EARLIER VERSION TRANSMITTED TO THEM IN LATE APRIL, AS WELL AS FURTHER REFINEMENTS OF OUR THINKING. IN PROVIDING REVISED APPROACH PAPER, YOU SHOULD EMPHASIZE THAT WE ARE MOST ANXIOUS TO RECEIVE ANY VIEWS AND COMMENTS ON IT. YOU SHOULD ALSO SOLICIT EXPRESSIONS OF INTEREST ON THE PART OF ADDRESSEES IN SPECIFIC TECHNICAL AREAS OUTLINED IN THE PAPER IN WHICH THEY WOULD LIKE TO WORK. AFTER COMMENTS AND EXPRESSIONS OF INTEREST HAVE BEEN RECEIVED, WE WOULD ANTICIPATE A GENERAL MEETING OF PARTICIPANTS WOULD BE HELD, PERHAPS IN FALL, TO FORMALLY INITIATE THE EVALUATION. FINALLY, YOU SHOULD NOTE THAT EXPERTS FROM THE SEVEN NATIONS THAT
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PARTICIPATED IN THE LONDON ECONOMIC SUMMIT WILL BE

MEETING IN PARIS, JUNE 8-9, TO DISCUSS GENERAL NON-PROLIFERATION ISSUES, ONE OF WHICH WOULD BE THE EVALUATION.

5. FOR SEOUL: WHILE ORIGINAL APPROACH PAPER WAS NOT TRANSMITTED TO ROK, WE NOW BELIEVE IT WOULD BE USEFUL TO DO SO. IN PASSING PAPER TO KOREANS, YOU SHOULD NOTE THAT INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION WAS PROPOSED IN PRESIDENT'S APRIL 7 NUCLEAR POLICY STATEMENT AND THAT SUCCESSFUL INITIATION OF IT IS ESSENTIAL ELEMENT OF OUR OVERALL NON-PROLIFERATION STRATEGY. YOU SHOULD ALSO INDICATE THAT NOSENZO AND SIEVERING WOULD BE PREPARED TO DISCUSS THE EVALUATION IN DETAIL DURING PROPOSED MID-JULY MEETING OF JOINT STANDING COMMITTEE. ALTERNATIVELY, IF VISIT OF ADAMS, HELFRICH, AND LA FLEUR TAKES PLACE, THEY WOULD ALSO BE PREPARED TO DISCUSS THE EVALUATION.

6. FYI. FOR PARIS, LONDON, BONN, OTTAWA, TOKYO, AND ROME: WE ANTICIPATE THAT FRENCH WILL PROVIDE CONCERNED GOVERNMENTS A SEPARATE PAPER IN ADVANCE OF JUNE 8-9 SUMMIT EXPERTS MEETING, WHICH WILL REFLECT THEIR DESIRE FOR GREATER EMPHASIS ON REPROCESSING IN THE EVALUATION. END FYI. VANCE

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